



CXOXLPN OSCILLATOR

20 MHz to 50 MHz
Ultra-Miniature, Low Phase Noise & Low Jitter
High Shock Crystal Oscillator

DESCRIPTION

Statek's ultra miniature and ultra low phase noise and jitter oscillators consist of a CMOS/TTL compatible hybrid circuit and a state-of-the-art, miniature, fundamental-mode crystal. Typical RMS Jitter 12 kHz to 20 MHz - 153 femto seconds.



FEATURES

- High shock resistance (HG version) - 50,000 g option
- CMOS output with Enable/Disable
- Low phase noise and jitter
- Full military testing available
- Low acceleration sensitivity - 0.5 ppb/g or better option
- Wide supply voltage (1.8 V to 3.3 V)
- No PLL artifacts
- Hermetically sealed ceramic package
- Designed and manufactured in the USA

APPLICATIONS

Military & Aerospace

- Smart munitions
- Communications
- Navigation
- GPS

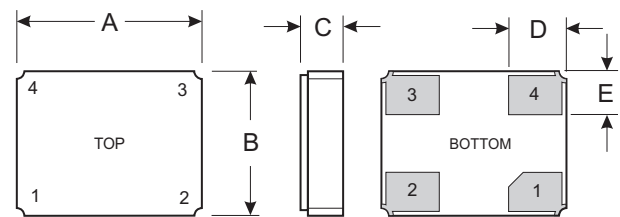
Industrial, Computer & Communications

- Miniature clock oscillator
- Handheld instrumentation
- PDA
- Transponder/Animal migration

Medical

- Test & diagnostic equipment
- Handheld devices

DIMENSIONS

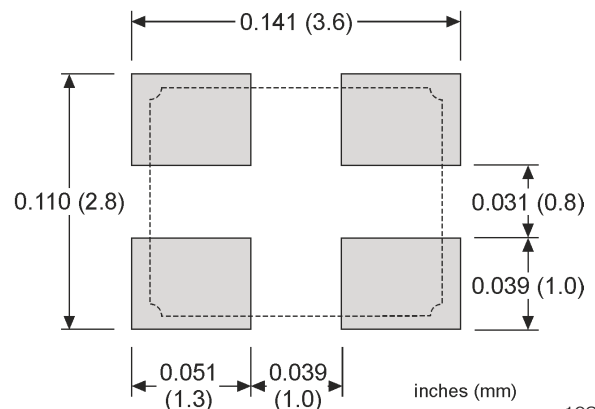


DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM3/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

PIN CONNECTIONS

1. Output Enable/Disable (E) or no connection (N)
2. Ground
3. Output
4. V_{DD}

SUGGESTED LAND PATTERN



10226 Rev A



SPECIFICATIONS

Specifications below are examples. Specifications are subject to change without notice. Tighter specifications available. Please contact factory.

Frequency Range	20 MHz to 50 MHz		
Supply Voltage	1.8 V to 3.3 V \pm 10%		
Calibration Tolerance ¹	\pm 50 ppm		
Frequency Stability Over Temperature ²	\pm 30 ppm for Industrial \pm 50 ppm for Military		
Supply Current (Typical) ³	<u>1.8V</u>	<u>3.3V</u>	<u>2.5V</u>
20 MHz	0.5 mA	1.4 mA	0.7 mA
30 MHz	0.6 mA	1.6 mA	0.8 mA
50 MHz	0.9 mA	2.1 mA	1.3 mA
Output Load (CMOS)	15 pF		
Start-up Time	5 ms MAX		
Rise/Fall Time	6 ns MAX		
Duty Cycle	45% MIN 55% MAX		
Aging, first year	3 ppm MAX		
Shock, survival	STD: 5,000 g, 0.3 ms, 1/2 sine High Shock Options in "How to Order"		
Vibration, survival ⁴	20 g, 10-2,000 Hz swept sine		
Operating Temp. Range	-10°C to 70°C (Commerical) -40°C to 85°C (Industrial) -55°C to 125°C (Military)		

1. Tighter tolerances available.
 2. Does not include calibration tolerances. Tighter tolerances available.
 3. No Load 25°C.
 4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.
- Note: All parameters are measured at ambient temperature with a 10 M Ω , 15 pF load.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage V_{DD}	-0.3 V to 4.0 V
Storage Temperature	-55°C to 125°C
Maximum Process Temperature	260°C for 20 seconds

ENABLE/DISABLE OPTIONS (E/N)

Statek offers two enable/disable options: E and N. The E-version has a Tri-State output and stops oscillating internally when the output is put into the high Z state. The N-version does not have PIN 1 connected internally and so has no enable/disable capability. The following table describes the Enable/Disable option E.

ENABLE/DISABLE OPTION E FUNCTION TABLE

	Enable (Pin 1 High*)	Disable (Pin 1 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Stops
Current	Normal	Very Low

*When PIN 1 is allowed to float, it is held high by an internal pull-up resistor.

PACKAGING OPTIONS

- CXOXLPN - Tray Pack
- 12 mm tape, 7" or 13" reels Per EIA 481

PHASE NOISE AND JITTER PERFORMANCE

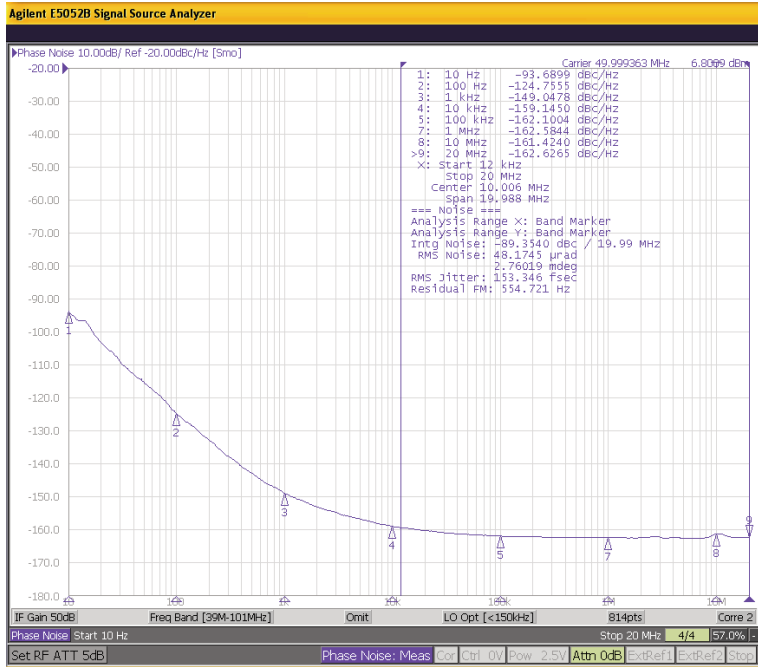
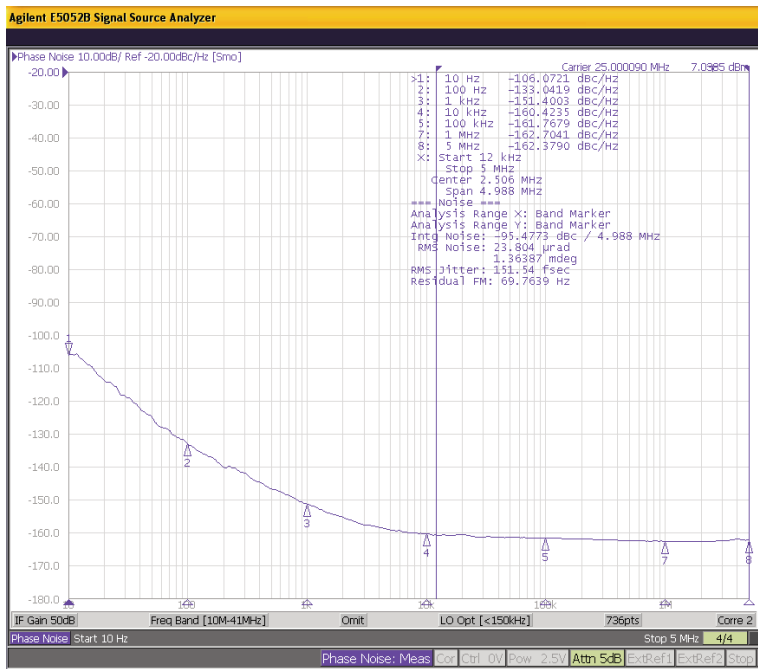
Typical Phase Noise (dBc/Hz)		
Frequency Offset (Hz)	Clock Frequency (MHz)	
	25 MHz	50 MHz
10 Hz	-106	-93
100 Hz	-133	-124
1 kHz	-151	-149
10 kHz	-160	-159
100 kHz	-161	-162
1 MHz	-162	-162
5 MHz	-162	-162
20 MHz	- - -	-162

Integrated RMS Jitter (12 kHz to 20 MHz) ¹		
Frequency	$V_{DD} = 2.5V$	$V_{DD} = 3.3V$
25 MHz	160 femtosec.	151 femtosec.
50 MHz	179 femtosec.	153 femtosec.

20 MHz integration point is Clock Frequency dependent.

Period Jitter (Typical) 10,000 cycles		
Frequency	RMS	Peak to Peak
25 MHz	1.15 Pico seconds	9.6 Pico seconds
50 MHz	1.02 Pico seconds	8.1 Pico seconds

PHASE NOISE PERFORMANCE AT 25 MHz AND 50 MHz



HOW TO ORDER CXOXLPN SURFACE MOUNT CRYSTAL OSCILLATORS

CXOXLPN 4 D S N SM3 — 25.0M , 50 / 50 / — / I

Supply Voltage 1 = 1.8 V 2 = 2.5 V 3 = 3.0 V 4 = 3.3 V	Shock Level A = 5,000 g B = 10,000 g C = 20,000 g D = 30,000 g F = 50,000 g	"S" if special or custom design. Blank if Std.	Enable/Disable Option E or N	Terminations Blank = SM1 = Gold Plated (Lead Free) SM3 = Solder Dipped SM5 = Solder Dipped (Lead Free)	Frequency M = MHz	Calibration Tolerance @ 25°C (in ppm)	Frequency Stability over Temp. Range (in ppm)	Temp. Range: C = -10°C to +70°C I = -40°C to +85°C M = -55°C to +125°C S = Customer Specified
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OR

Total Frequency Tolerance (in ppm)	Temp. Range: C = -10°C to +70°C I = -40°C to +85°C M = -55°C to +125°C S = Customer Specified
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